



Research Project Proposal
Academic year 2021-2022
Máster en Investigación Biomédica

Project Nº 29	
Title: Role of interleukin-1 β in the infiltration and polarization of macrophages in adipose tissue	
Department/Laboratory Functional Metabolomics Laboratory, Department of Endocrinology & Nutrition. Clínica Universidad de Navarra.	
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Summary	
<p>Background: The obesity-associated low-grade chronic inflammation results from the interaction between adipocytes and cells from the immune system, mainly macrophages. Obesity induces a phenotypic switch from an anti-inflammatory M2-polarized state to a pro-inflammatory M1 state mediated through different cytokines.</p> <p>Hypothesis: This project addresses the hypothesis that the adipose tissue excess and the glycemic state underlay the changes in the gene expression of the proinflammatory cytokine interleukin-1β. In this way, interleukin-1β may play a role in the macrophage polarization, aggravating the inflammatory state of obese patients. In addition, the blockade of interleukin-1β using siRNA may contribute to improve the inflammation of adipose tissue associated to obesity.</p> <p>Objectives and Methods: The involvement of interleukin-1β in M1 polarization will be determined in human adipocytes and macrophages cell cultures as well as the potential use of blockade of interleukin-1β in the improvement of the obesity-associated inflammatory state. In addition, the effect of conditioned medium secreted by adipocytes, with normal expression of interleukin-1β or silenced, on gene expression profile of macrophages will be studied. Moreover, the relationship with other inflammatory markers as well as extracellular matrix components will be also studied.</p> <p>The following techniques will be used:</p> <p><i>Sample processing:</i></p> <ul style="list-style-type: none"> - Serum, plasma and buffy coat extraction - Cellular isolation from adipose tissue - RNA isolation from adipose tissue and peripheral blood mononuclear cells - Protein extraction from adipose tissue <p><i>Biology molecular techniques:</i></p> <ul style="list-style-type: none"> - Nucleic acid and protein quantification and quality assessment - Analysis of gene expression by Real-time PCR - Analysis of protein expression by Western-blot <p><i>Analytic techniques:</i></p> <ul style="list-style-type: none"> - ELISAs - Large-scale cytokine analyses <i>Multiplex</i> (Luminex™ 200) - Immunohistochemical analysis of proteins <p><i>Human macrophage and adipocyte cell cultures</i></p>	
yes	<input type="checkbox"/>
no	<input checked="" type="checkbox"/>
Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?	